

Claims 1 to 3, 5 to 7, 9 to 15, 17 to 19 and 21 to 26 are in the application, of which Claims 1, 7, 13, 19, 25 and 26 are independent. Reconsideration and further examination are respectfully requested.

All claims were rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,505,205 (Kothuri). The rejections are respectfully traversed.

Claims 1, 13 and 25

One aspect of the invention as defined in Claim 1 relates to the creation of a split tree from an input tree. The input tree comprises a plurality of nodes. A determination is made as to which of the plurality of nodes fit into a galley target. Nodes that fit into the galley target are marked with a mark specific to the galley target so as to create a split tree in which each tree fragment is identified by a respective mark. Thus, the split tree represents the input tree and at least one tree fragment obtained by splitting the input tree.

According to more detailed aspects of the invention, the determination proceeds by sub-steps including the steps of setting one of the plurality of nodes as a current node for the galley target, and comparing the size of a current node with available space in the galley target. If the size of the current node is not greater than the available space, then it is decided that the current node fits into the galley target. On the other hand, if the size of the current node is greater than the available space, then further sub-steps are performed as follows: determining whether the current node has at least one child node,

setting one of the child nodes as the current node if the current node has at least one child node, and recursively executing these steps with respect to the new current node.

Thus, according to this aspect of Applicant's invention, an input tree is split into one or more tree fragments, and a split tree is created representing both the input tree and the respective tree fragments.

Kothuri is seen to teach a method of apparatus for indexing and storing multi-dimensional and multi-attribute data in a relational or object-relational database management system. An R-tree is used to index the data. Kothuri's method operates by recursively storing data items in a selected dimension, and dividing the data items until each subdivision fits into a leaf node having a specified fanout period. Kothuri's Figure 3 gives one example.

As depicted in Figure 3, eleven data items exist in the two-dimensional data set 300. As the data items are to be indexed in a representative R-tree having a specified fanout of three, a root node of the R-tree cannot store all eleven data items. The data set 300 is recursively divided by creating dividing lines 310, 312 and 314, which proceeds until each subdivision of the data set 300 can fit into a node of the R-tree having a fanout of three. The R-tree is then created by placing each of the four clusters 320, 322, 324 and 326, into a separate leaf node. For each leaf node, parent nodes may be formed, followed by grandparent nodes, etc., until a root node 402 is formed. See column 10, line 59, through column 12, line 6.

Even though it is true that Kothuri teaches a tree structure comprising a plurality of nodes, Kothuri is not seen to split an input tree into tree fragments, and then to

mark the input tree in a manner which represents both the input tree itself and each of the tree fragments. Rather, as explained above, Kothuri creates a tree from a data set. In doing so, Kothuri determines whether the data items fit into the node capacity (that is, the specified fanout). This is seen by Applicant to differ fundamentally from the claim's determination of which of the plurality of nodes fit into a galley target, for the reason that the size of each child node contributes to the overall size of the node, and nodes already placed in the galley target therefore reduce the available space in the galley target. In Kothuri, on the other hand, each node has a specified fanout which is completely independent of the size and number of Kothuri's child nodes.

Page 4 of the Office Action concedes that Kothuri does not teach "marking the nodes that fit into said galley target with a mark specific to the galley target so as to create a split tree in which each tree fragment is identified by a respective mark, and wherein said split tree represents the input tree and at least one tree fragment obtained by splitting the input tree". Despite this significant concession, the Office Action equated Kothuri's identifier with the claimed marking. Applicant respectfully submits that such a correspondence is overly broad, and is an unwarranted simplification of the invention to a mere identifier. Kothuri's identifiers provide a means for indexing an association between separate nodes, whereas the markings of Applicant's invention are much more.

Moreover, as Applicant sees it, Kothuri does not teach splitting an input tree into tree fragments. Accordingly, any identifiers taught in Kothuri do not represent the same information as the claimed marks, since Kothuri's identifiers do not represent both the input tree and at least one tree fragment obtained by splitting the input tree.

It is therefore respectfully submitted that Claims 1, 13, and 25 would not have been obvious from any reasonable inferences drawn from Kothuri.

Claims 7, 19 and 26

According to another aspect of Applicant's invention for forming at least one tree fragment from a split tree, the nodes of the split tree are marked with marks. An identification is made of the nodes of the split tree marked with respective marks, each respective mark being associated with a respective tree fragment. Thereafter, respective tree fragments are created from the nodes marked with the respective marks.

As noted above, Kothuri is not even seen to teach the concept of forming tree fragments. As a consequence, therefore, it could not possibly disclose or suggest anything with respect to the formation of a tree fragment from a split tree, muchless forming tree fragments from a tree structure with nodes marked with marks where each respective mark is associated with a respective tree fragment.

Furthermore, Kothuri is not seen to teach or suggest identification of nodes of a split tree marked with respective marks, and thereafter creation of respective tree fragments from the nodes marked with the respective marks. In particular, and as discussed above, Kothuri's identifiers of nodes do not contain any information that may be used for splitting the tree of Kothuri into tree fragments.

It is therefore respectfully submitted that each of independent Claims 7, 19 and 26 is allowable over Kothuri.